SOOS
SOUTHERN OCEAN OBSERVING SYSTEM

West Antarctic Peninsula and Scotia Arc Regional Working Group

Welcome to the July 2025 edition of the West Antarctic Peninsula and Scotia Arc (WAPSA) Regional Working Group newsletter!

In this edition, we're spotlighting cutting-edge research from one of our members, sharing exciting updates from the field, showcasing recent activities across the WAPSA community, and highlighting newly published studies from the region.

We hope you enjoy this glimpse into the dynamic science unfolding in the WAPSA region. **Curious to learn more about our working group?** Visit our webpage!

Polar Profiles: Carlos Moffat

Associate Prof, University of Delaware & WAPSA Co-Chair

I am a physical oceanographer interested in understanding how the ocean, the atmosphere, and the cryosphere interact to drive environmental change around Antarctica. My work focuses on understanding the processes that modulate the heat and salt budgets on the coastal ocean, which in turn help us explain ice loss from the continent. As part of the Palmer Long-Term Ecological research program, I am also interested in how long-term change in the ocean physical environment impacts marine ecosystems. I'm constantly learning about new problems from going to sea and interacting with a multidisciplinary team studying marine productivity, plankton dynamics, biogeochemistry, seabirds, and whales. One of the most rewarding parts of my job is working with many international colleagues and early career researchers to advance our science. As Antarctica undergoes rapid change, our work is more relevant and urgent than ever, and I look forward to keeping working with SOOS to advance international collaboration around the continent.

Field Notes: POLOMINTS

Polar Ocean Mixing by Internal Tsunamis

A team of scientists has just returned from a groundbreaking expedition aboard the *RRS Sir David Attenborough*, conducting research during the polar winter as part of the British Antarctic Survey's POLOMINTS (Polar Ocean Mixing by Internal Tsunamis) project. This exciting project is led by Principal Investigator Prof. Michael Meredith and includes a diverse group of WAPSA scientists.

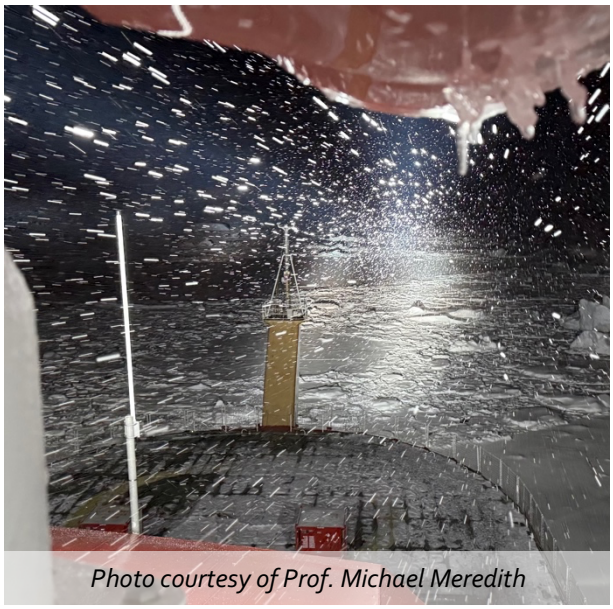


Photo courtesy of Prof. Michael Meredith

What is the aim of POLOMINTS?

- To gain a detailed understanding of how different forms and sizes of glacier calving, along with fjord and shelf shapes, generate internal tsunamis. This helps advance knowledge of ice-ocean interactions in regions that are important for climate, biogeochemistry, and ecology.
- To assess how ocean mixing caused by these internal tsunamis affects the distribution and exchange of ocean heat, nutrients, and carbon – and how these processes might change in the future.
- To improve ocean models by representing the vigorous and episodic mixing driven by internal tsunamis, addressing one of the least understood components of the Earth system.

Beyond braving Antarctica at its harshest, the researchers experienced an unusually light sea ice cover for winter that allowed for amazing wildlife encounters, as well as unique extended twilight periods, and stunning clear night skies.

Read more about this exciting research adventure in a recent article by Prof. Michael Meredith.

Visit the POLOMINTS webpage to learn more about the project.

Photo courtesy of Prof. Michael Meredith

Currents and Conversations: National Academies Workshop

Exploring Key Research Topics for the Fifth International Polar Year (IPY)

Our Co-chair, Carlos, recently participated in a workshop hosted by the National Academies on May 20–21. This event marked a significant step in planning for the upcoming IPY5, scheduled for 2032–2033.

The workshop brought together a diverse group of experts to engage in strategic discussions that will shape the direction of IPY5. Some key objectives included:

- Define critical research priorities and operational needs to guide the scientific directions
- Highlight innovative technologies and capabilities (current and emerging) that can enhance polar research
- Foster inclusive collaboration and engagement, including strengthening partnerships across disciplines and providing a platform for early-career researchers to help shape IPY5 initiatives.

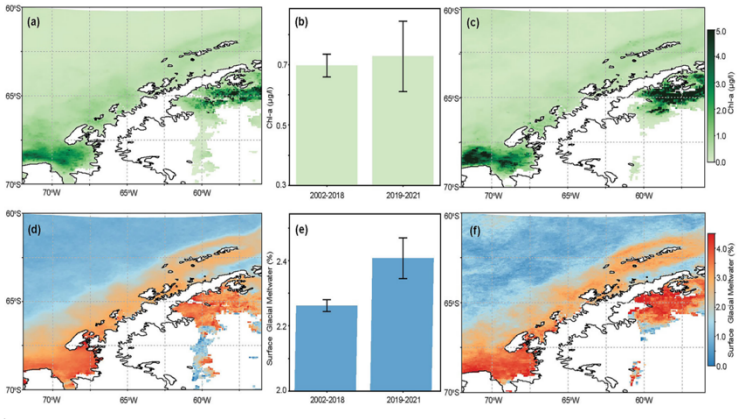
For more information, head over to the National Academies webpage to learn more about this workshop.

Fresh Floes: New Research!

Impact of glacial meltwater on phytoplankton biomass along the Western Antarctic Peninsula

Jack Pan, B., Gierach, M. M., Stammerjohn, S., Schofield, O., Meredith, M. P., Reynolds, R. A., ... & Miller, C. E. (2025). Impact of glacial meltwater on phytoplankton biomass along the Western Antarctic Peninsula. Communications Earth & Environment, 6(1), 1-10.

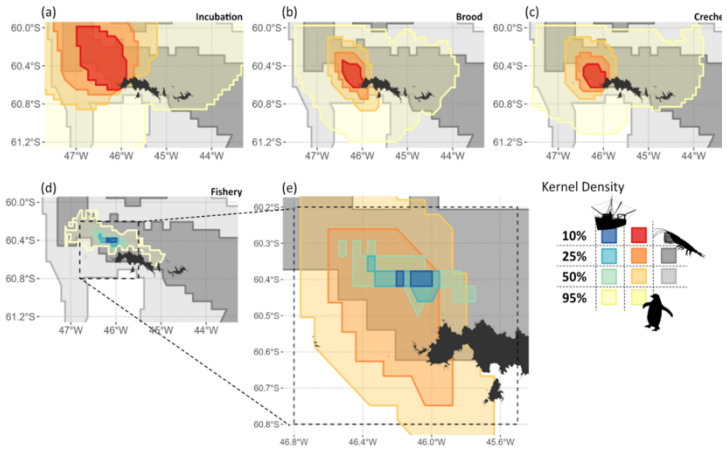
This study integrates 20 years of remote sensing and field data to assess a key ecological driver in this region: the influence of glacial meltwater on phytoplankton biomass. The findings reveal that the combined effects of nutrient input and surface ocean stabilization from meltwater are closely linked to elevated chlorophyll-a concentrations. These results suggest that glacial melt may partially offset the negative ecological consequences of regional sea-ice loss.



A new dynamic distribution model for Antarctic krill reveals interactions with their environment, predators, and the commercial fishery in the south Scotia Sea region

Freer, J. J., Warwick-Evans, V., Skaret, G., Krafft, B. A., Fielding, S., & Trathan, P. N. (2025). A new dynamic distribution model for Antarctic krill reveals interactions with their environment, predators, and the commercial fishery in the south Scotia Sea region. Limnology and Oceanography.

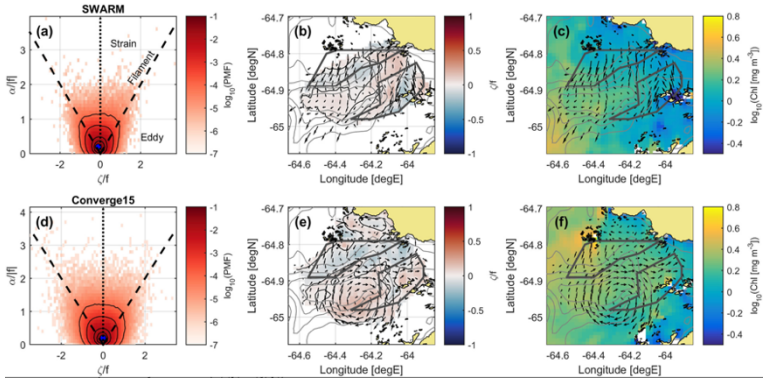
Spatial data on krill distribution and abundance is critical for effective fisheries management. Yet, significant gaps persist around the South Orkney Islands in the southern Scotia Sea. Using a dynamic distribution model, this study identifies the northern and eastern shelf edges of the islands as persistent krill hotspots. However, these areas also exhibit significant spatial overlap between intense fishing activity and foraging areas for chinstrap penguins. As a result, this study highlights the urgent need to reassess current krill fisheries management to conserve foraging areas.



Disentangling advection and Lagrangian evolution of surface chlorophyll in a nearshore submarine canyon using satellite remote sensing and high-frequency radar

McKee, D. C., Veatch, J. M., Kavanaugh, M. T., Kohut, J. T., & Doney, S. C. (2025). Disentangling advection and Lagrangian evolution of surface chlorophyll in a nearshore submarine canyon using satellite remote sensing and high-frequency radar. *Journal of Geophysical Research: Oceans*, *130*(5), e2024JC022101.

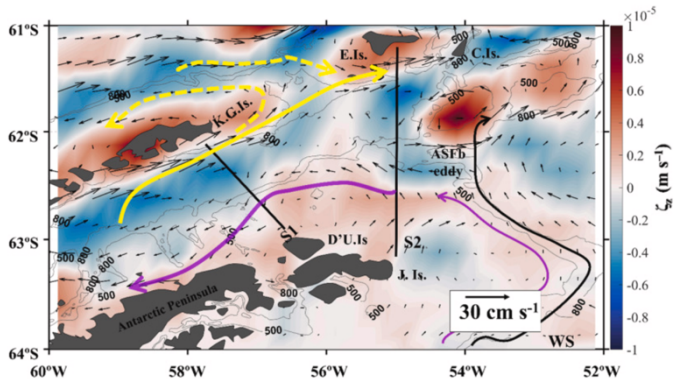
Palmer Deep Canyon on the western Antarctic Peninsula supports high penguin populations and elevated chlorophyll-a levels. Using radar-derived surface currents and satellite chlorophyll, this study shows that advection drives productivity, especially on the canyon's western flank. However, Lagrangian chlorophyll changes that are potentially linked to biological sources, can rival advection. Phytoplankton increases align with cyclonic features, suggesting flow structure influences biomass distribution. These findings highlight advection–biology interplay shaping productivity in this ecologically critical region.

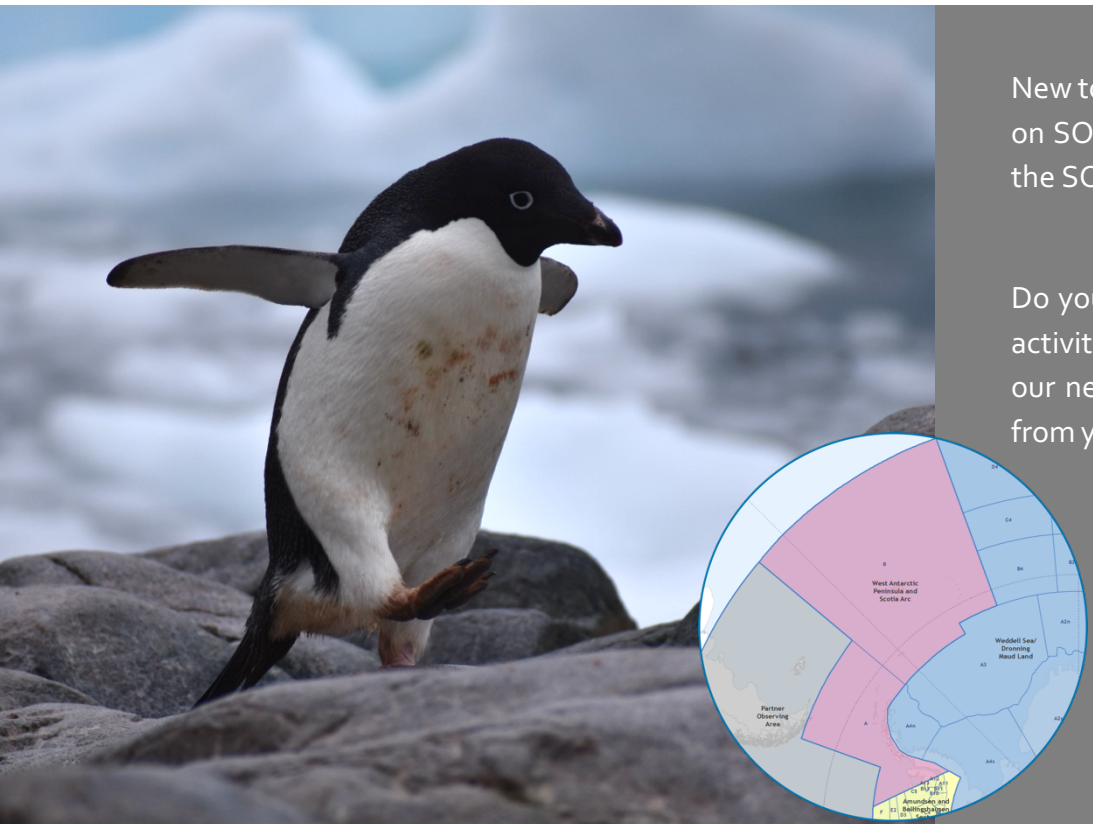


Summer circulation and water masses transport in Bransfield Strait, Antarctica: An evaluation of their response to combined effects of Southern Annular Mode and El Niño–Southern Oscillation

Damini, B. Y., Brum, A. L., Hall, R. A., Dotto, T. S., Azevedo, J. L. L., Heywood, K. J., ... & Kerr, R. (2025). Summer circulation and water masses transport in Bransfield Strait, Antarctica: An evaluation of their response to combined effects of Southern Annular Mode and El Niño–Southern Oscillation. *Deep Sea Research Part I: Oceanographic Research Papers*, 104516.

The Bransfield Strait, a key convergence zone for water masses influenced by both the Weddell and Bellingshausen Seas, is a critical region for studying climate change impacts. Using high-quality hydrographic data (2003–2019), satellite altimetry, and global eddy-resolving reanalysis, this novel study reveals the significant influence of the of SAM and ENSO (jointly called the SEI index) on the mixture of water masses present in the Bransfield Strait, as well as the pathway these water masses follow to enter the strait. Notably, Bellingshausen-influenced water masses (TBW) inflow increases by 30% during positive SEI conditions.





New to SOOS and want to receive updates on SOOS activities and products, and join the SOOS community? Subscribe here

Do you have any exciting WAPSA-related activities or research you'd like to share in our next newsletter? We're eager to hear from you – get in touch! (hforrer@fsu.edu)

Until next edition – best wishes from the WAPSA team!